CLAIMS

1. A method of positioning a recording head relative to an optical servo system in a magnetic recording tape system read/write assembly comprises:

positioning an optical sensor of the optical servo system at a first position relative to a selected one of a plurality of recording channels on the recording head; and

positioning the optical sensor at a second position relative to the selected recording channel using an alignment target on the recording head.

2. The method of claim 1 wherein positioning the optical sensor at the first position comprises:

visually aligning under a microscope the optical sensor relative to the recording channel along an imaginary line with an optical servo system adjuster; and

temporary locking the optical servo system in place with the adjuster.

3. The method of claim 1 wherein the alignment target includes a plurality of etched parallel grooves, the grooves positioned parallel to a direction of magnetic tape travel.

4. The method of claim 3 wherein each of the grooves comprises a profile to enhance optical signal reflectivity.

5. The method of claim 4 wherein the profile comprises:

a groove depth;

a sloped wall having a groove angle; and

a bottom shape.

6. The method of claim 5 wherein the groove depth is in the range of 200-300 nanometers.

7. The method of claim 5 wherein the groove angle is 50-60 degrees.

8. The method of claim 5 wherein the bottom shape is round.

9. The method of claim 3 wherein each of the grooves is fabricated on a silicon wafer.

10. The method of claim 3 wherein each of the grooves is fabricated on aluminum titanium carbide (AlTiC) wafer.

11. The method of claim 3 wherein each of the grooves is fabricated on a silicon/ AlTiC wafer.

12. The method of claim 3 wherein the grooves are fabricated using image reversal resist.

13. The method of claim 3 wherein the grooves are fabricated using a bi-layer resist process.

14. The method of claim 1 wherein the alignment target is positioned between one read-write element of the selected recorded channel and the other read-write element of the selected recording channel.

15. The method of claim 3 wherein positioning the optical sensor at a second position comprises:

directing a beam of light from the optical servo system towards the grooves;

moving the optical servo system perpendicularly to the grooves until a maximum optical reflectance signal is detected by an optical sensor of the optical servo system; and

locking the optical servo system with the adjuster when a minimum optical reflectance signal is detected.

16. A recording head in a read/write assembly of a magnetic recording tape system comprises:

a plurality of recording channels fabricated on a wafer; and

an alignment target affixed to the wafer between a first read-write element of a recording channel and a second read-write element of the recording channel, the alignment target fabricated to produce an optical reflectance signal.

17. The recording head of claim 16 wherein the alignment target is affixed to the wafer using an ultraviolet (UV) cured adhesive.

18. The recording head of claim 16 wherein the recording head and the alignment target are fabricated from the same material.

19. The recording head of claim 18 wherein the material is silicon.

20. The recording head of claim 18 wherein the material is aluminum titanium carbide (*AlTiC*).

21. The recording head of claim 18 wherein the material is silicon - *AlTiC* composite.

22. The recording head of claim 16 wherein the alignment target comprises a plurality of etched alignment grooves, each of the grooves equally spaced apart from each other and arranged parallel to a direction of magnetic tape travel.

23. The recording head of claim 22 wherein the grooves are fabricated using an image reversal resist process.

24. The recording head of claim 22 wherein the grooves are fabricated using a bi-layer resist process.

25. The recording head of claim 16 wherein each of the grooves has a profile to maximize optical signal reflectivity.

26. The recording head of claim 25 wherein the orientation comprises a groove depth, a sloped wall groove angle and a bottom shape.

27. The recording head of claim 26 wherein the groove depth is in the range of 200 to 300 nanometers.

28. The recording head of claim 26 wherein the sloped wall groove angle is in the range of 50 to sixty degrees.

29. The recording head of claim 26 wherein the bottom shape is round.

30. An alignment target for aligning a flathead recording head relative to an optical servo system in a read/write assembly of a magnetic tape recording system comprises equally spaced alignment grooves having dimensions to fit between a recording channel pair residing on the flathead recording head, the groove oriented parallel to a direction of tape travel across the flathead recording head.

31. The alignment target of claim 30 wherein each of the alignment grooves is fabricated to a profile to minimize optical signal reflectance.

32. The alignment target of claim 33 wherein the profile comprises a groove depth, a sloped wall groove angle and a bottom shape.

33. The alignment target of claim 32 wherein the groove depth is in the range of 200 to 300 nanometers.

34. The alignment target of claim 32 wherein the sloped wall groove angle is in the range of 50 to sixty degrees.

35. The alignment of claim 32 wherein the bottom shape is round.

36. A method comprising:

sizing a wafer to fit between two adjacent recording channels residing on a recording head of a magnetic read/write assembly; and

forming a plurality of equally spaced parallel alignment grooves arranged perpendicularly to a length of the wafer a parallel to a travel direction of a magnetic tape.

37. The method of claim 36 wherein forming comprises cutting the wafer to maximize an optical signal reflectance.

38. The method of claim 37 wherein cutting comprises a groove depth, a groove angle and a bottom shape in the wafer.

39. The method of claim 38 wherein cutting comprises an image reversal resist process.

40. The method of claim 38 wherein cutting comprises a bi-layer resist process.